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INTRODUCTION

The weather of the year as a whole did not show an extreme departure from normal as did 1930 and 1931. Perhaps the most notable features were the mild preceding winter and cold March and the dry fall in the West.

Late winter was very mild east of the Rockies, but somewhat below normal in temperature in the mountain and Pacific regions, especially in the Great Basin. January rainfall was normal or higher in most of the country, whereas February was rather deficient in precipitation.

March was warmer than normal on the Pacific Coast, but much colder in the rest of the country, with a long severe cold wave early in the month. April and May were generally slightly above normal in temperature. Rainfall was variable, near normal early in the spring, and rather deficient late in the spring.

The summer months were near but somewhat above normal in temperature, the northern plains being especially warmer. Summer rainfall was variable, near normal on the whole, rather below normal in July, but usually sufficient for crops.

The fall months were near normal in temperature, with rather warm weather on the Pacific Coast; there was considerable, but not extreme, cold weather in early winter. Precipitation during the period was generally plentiful east of the Mississippi but scanty westward, with drought injury in the hard winter-wheat region.

The mild winter was reflected by material northward advances of many southern species of insects, and the practically normal year was associated with decided increases of many of our troublesome species.

GRASSHOPPERS

The infestation of grasshoppers (Melanoplus spp.) in the Great Plains was more widespread than it was in 1931 but, in general, less severe. Rainy, cool weather in May and June in the southern part of this area resulted in a rank growth of wild vegetation and a reduction in damage to cultivated crops. This weather was unfavorable to the development of young hoppers, and later parasitic flies and sometimes a fungus disease further reduced the grasshoppers. The most seriously infested areas this year were in eastern North Dakota, northwestern Minnesota, central and south-central South Dakota, and to a lesser extent northern Wisconsin and northern Michigan. Another section of somewhat severe damage was reported from north-central Nebraska. The American grasshopper (Schistocerca americana Drury) became unusually abundant in the Gulf region and along the south Atlantic seaboard, late in the season.

EUROPEAN CORN BORER

The European corn borer (Pyrausta nubilalis Hbn.) did not spread so far as usual this year. Newly infested townships in Indiana, Kentucky, Pennsylvania, Maryland, and Virginia, however, were found this fall. The corn borer is now known to infest portions of the New England, Middle Atlantic, and East Central States, westward to Wisconsin and Indiana, and southward to Kentucky, West Virginia, and the Eastern shores of Maryland and Virginia, and the eastern corn-growing provinces of Canada. Populations in general showed increases over those of 1931 and 1930. In the one-generation area the densest infestation is around the eastern end of Lake Ontario in New York State, and the greatest increase in population in the eastern three tiers of counties south of Lake Huron in Michigan. Along the seaboard of New England and on Long Island, New York, the infestation and population increase was heavier than in other parts of the two-generation area.

ARMYWORM

Early in the summer infestations of the armyworm (Cirphis unipuncta Haw.) were quite generally reported from Iowa and southeastern and eastern Nebraska. These, however, did not develop into serious outbreaks.

CUTWORMS

During the winter months cutworms were very active throughout the Gulf region. During March heavy infestations occurred along the South Atlantic seaboard where the worms were damaging tobacco and early truck crops. The damage in places to tobacco was more severe than it has been for several years. During April one of these insects stripped 100 acres of sugarcane in the Everglades section of Florida, and the dark-sided cutworm (Euxoa messoria Harr.) was seriously damaging alfalfa in east-central Nebraska. A small outbreak of the army cutworm (Chorizagrotis auxiliaris Grote) was reported in April in Montana. During May reports of cutworm damage were received from practically the entire country, from Maryland to Washington State and southward to the Gulf. During June the general cutworm outbreak subsided in most sections, but the pale western cutworm (Porosagrotis orthogonia Morr.) and the variegated cutworm (Lycophotia margaritosa saucia Hbn.) did considerable damage over the North Central States from Wisconsin to Montana and southward to Kansas and Tennessee.

HESSIAN FLY

The very favorable winter conditions that prevailed throughout the East Central States resulted in the appearance of the Hessian fly (Phytophaga destructor Say) in very threatening numbers in many parts of this region. The extremely cold weather that followed during the middle of March over the eastern part of this region undoubtedly materially reduced the number of these insects in places. In Illinois, Missouri, and Nebraska, however, the insect was not seriously affected and in general throughout the Winter Wheat Belt this insect was more numerous than it has been in several years. The late-summer surveys to ascertain the population of flies capable of infesting the fall-planted grain indicated unusually high populations from central Pennsylvania to southeastern Nebraska and central Missouri. In infestations over much of this territory over 30 per cent of the straws were infested. In New York State the infestation was only moderate, running from 4 to 15 per cent, but in Pennsylvania the situation was much more serious. That part of the State lying south of Union and Columbia Counties and east of Blair and Bedford Counties harbored populations running from 30 to 60 per cent. A similarly high infestation was recorded from the southwestern corner of the State and an infestation of over 30 per cent along its entire western border. This condition also extended southward into all of the wheat-growing counties in Maryland west of the Chesapeake Bay. The infestation on the eastern shore of this State and in Delaware was considerably lighter. In Ohio a belt of heavy infestation extended from the northern part of the State in an ever widening band until it covered the entire western border of the State. The heaviest part of this infestation was in the counties surrounding Wayne County. This band continued westward over the greater part of central and north-central Indiana with very heavy infestations in the west-central part of the State from White to Parke Counties. Another area of heavy infestation was in the southwestern corner of the State. In Illinois the band narrowed to cover about four tiers of counties from Vermillion and Lawrence Counties on the east to Greene and Jersey Counties on the west. As a whole in this State the infestations were heavier in the eastern than in the western counties. The band proceeded, though decidedly less intense, across central Missouri and into northern Kansas, passing on into southeastern Nebraska.

CHINCH BUG

The very favorable winter conditions that prevailed over the greater part of the East Central and West Central States resulted in large populations of the chinch bug (Blissus leucopterus Say) passing the winter successfully over much of this area. Cold rains of early May were somewhat detrimental to the insect, but the favorable weather which followed more than offset this check. Serious damage was done throughout central and western Illinois, with less severe damage across central Missouri and southeastern and south-central Kansas into the entire central area of Oklahoma. Damage was generally light in Indiana with the single exception of a small outbreak in the northeastern corner of the State in DeKalb, Allen and Huntington Counties, which extended across into the northwestern corner of Ohio. This insect became troublesome very much north of its usual range. Reports of damage have been received from the southern two tiers of counties in Michigan; the southern two tiers of counties in Iowa, as far west as Taylor and Union Counties, and from the southern tier of counties of Nebraska, going somewhat farther north in the southeastern part of the State. Isolated outbreaks occurred in the northwestern corner

of Iowa in Lyon County, along the Mississippi River in Minnesota and Wisconsin near Minneapolis and St. Paul, in parts of Pennsylvania, in Coahoma and Leflore Counties in Mississippi, and in Douglas and Charles Mix Counties in South Dakota.

GREEN BUG

The green bug (Toxoptera graminum Rond.) developed in threatening numbers during the late winter in the South Atlantic States and Gulf region. This, however, did not develop into a serious outbreak, although local outbreaks were reported from west-central Missouri, northwestern Mississippi, and south-central Pennsylvania.

ALFALFA WEEVIL

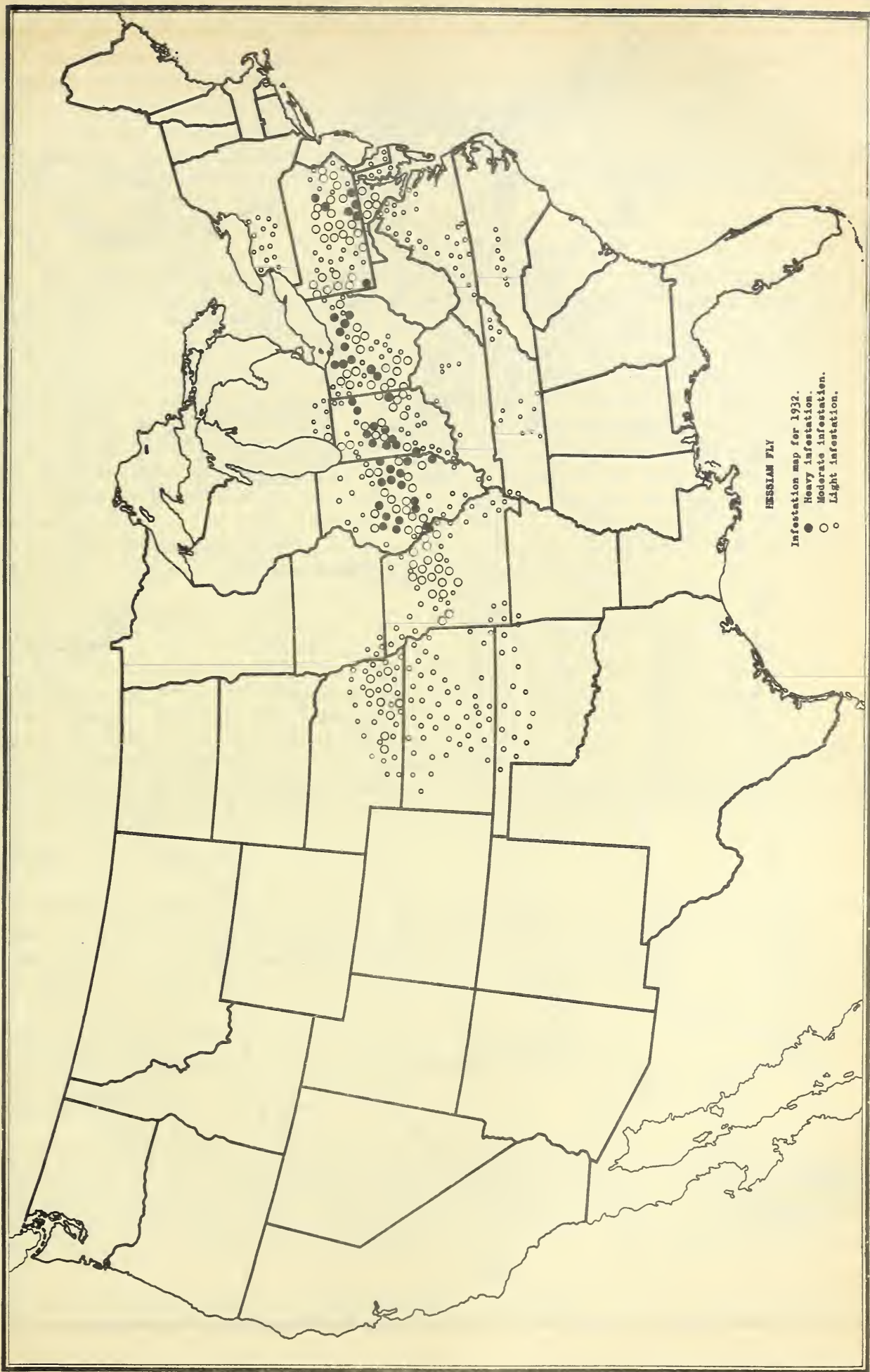
The alfalfa weevil (Hypera postica Gyll.), which started attracting attention in the Uintah basin of Utah in 1925, has gradually spread and increased until practically every alfalfa field in this basin suffered damage this year. The first serious damage occurred in this basin in 1931 and the insect is much worse this year than last. The insect was also reported as troublesome in a number of other parts of the State where it has been a pest for many years. This insect was also destructive in some of the valleys of western Nevada, while at other places it had dropped to a negligible factor. In the upper Snake River valley of Idaho the weevils were numerous enough noticeably to retard the growth of alfalfa, but in southwestern and southeastern Idaho weevils were from normal to subnormal in numbers. On May 12 a single specimen was found in the San Joaquin Valley near Tracy, Calif. Subsequent scouting showed that the infested area extends into the following five counties: Stanislaus, San Joaquin, Alameda, Contra Costa, and Santa Clara. In the last two counties the infestation is confined to two places in the northern third of the counties. Save for occasional infestation along the California-Nevada State line in Sierra, Plumas, Lassen, Alpine, and Mono Counties, this is the first record of establishment in the State of California.

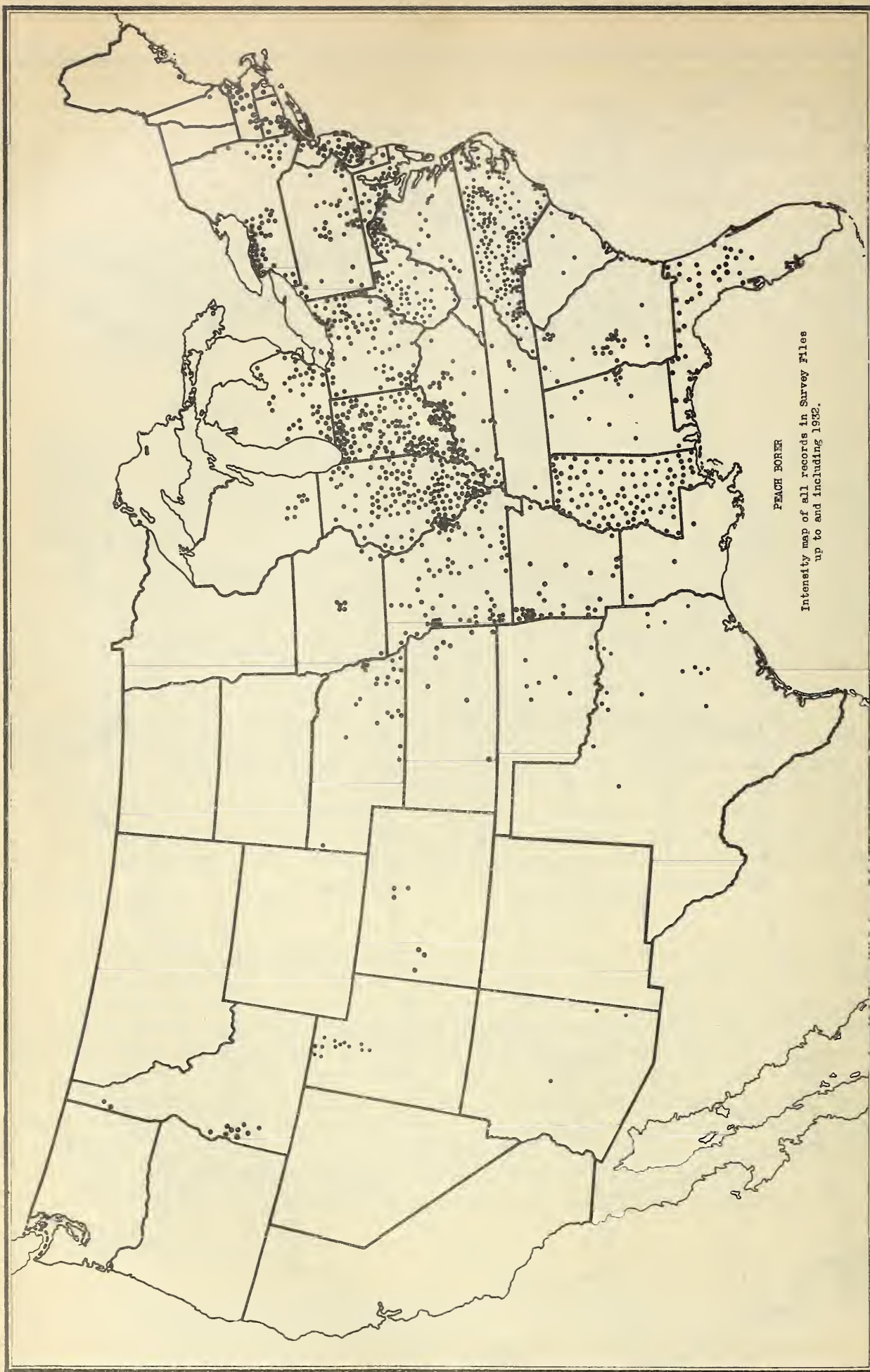
CODLING MOTH

The codling moth (Carpocapsa pomonella L.) survived the winter of 1931-32 with very low mortality. The March freeze, which acted adversely on so many insects, apparently had but little effect on the codling moth. During the third week of April pupation was well under way in the Middle Atlantic, East Central, and West Central States, and was about one-third complete in the Pacific Northwest. Late in the month emergence had started in the South Atlantic and South Central States, and in the Southwest adults were abundant in the bait pans by the middle of April. The peak of emergence in the East Central States occurred about the middle of May. In general the insect was very abundant throughout the greater part of the country this year. In Illinois it was more serious than it has been any time during the past 10 years.

ORIENTAL FRUIT MOTH

Early in February overwintering larvae of the oriental fruit moth (Grapholitha molesta Busck) began pupating in the South Atlantic States. Adults started emerging about the middle of April in the southern Middle Atlantic States, at which time egg-laying was observed in Georgia, while in





PEACH BORER
Intensity map of all records in Survey Files
up to and including 1932.

the fruit belt of western New York the insect was still in the larval stage. Early in April adults commenced to emerge as far north as Delaware. These emergence records are more or less in accord with those of previous years except that in Georgia the appearance was later than it had been any previous year since the establishment of the insect in that State. The insect seems to be gradually spreading into new territory. In many sections the damage to fruit was rather severe owing to the extremely short crop of fruit.

PEACH BORER

The suggested possibility of the association of the peach borer with the disease known as phoney peach has stimulated an interest in the distribution of this insect. We are therefore publishing in this number of the Survey Bulletin a map showing all of the records that we have on the distribution of this pest and the relative intensity of its infestation in the various regions. In general the insect is distributed over the United States east of the 100th meridian and south of southern Wisconsin, central Michigan, Lake Ontario, and the northern border of Massachusetts; scattering reports have been received west of the 100th meridian, and the insect seems to be well established in the Great Basin in Utah and in southwestern Idaho. On the West coast another species supplants the peach borer. What appear to be sparsely infested areas east of the Mississippi River are in all probability due to lack of observations of the permanent recording of such as were made.

MEXICAN FRUIT WORM

On the morning of January 29 an adult (Anastrepha ludens Loew) was caught in a grove about $2\frac{1}{2}$ miles northwest of Weslaco, Tex. This is apparently the first adult that has been collected on the American side of the river. Up to the end of March infestations were found in 40 groves extending from San Benito to Mission. The infestations were more general in Hidalgo County than in Cameron County. More groves were found infested in the Weslaco, Pharr-San Juan-Alamo, and Mission districts than in other parts of the county.

FIG MOTH

If one assumes a 1932 crop of about 13,000 tons of dried figs in California and bases computations on averages secured by the Food and Drug Administration, covering detected infestations, and consequent loss in sales value, of deliveries made at packing houses, the estimated loss to fig growers this year on account of infestation by insects will total about \$216,000, not including fruit culled out on ranches. The greatest part of this loss was caused by moth larvae, chiefly Ephestia figulilella Greg. (1)

PLUM CURCULIO

The plum curculio (Conotrachelus nenuphar Hbst.) appeared late over the eastern part of its range. It was first collected in the field in Tennessee on April 4; in Georgia April 5; in Virginia April 6; and in Delaware April 20. This is the latest appearance of adults in the past 12 years in Georgia. As

(1) Perez Simmons, Bureau of Entomology, U.S.D.A.

the season advanced this insect appeared to be somewhat more abundant than usual in the Mississippi Valley from Kentucky to Mississippi. Owing to the material curtailment of spraying over much of the eastern fruit belt the curculio went into winter quarters in 1932 over much more of its range in greater numbers than it did in 1931.

SAN JOSE SCALE

The large populations of the San Jose scale (Aspidiotus perniciosus Comst.) that built up during 1931 apparently passed the winter of 1931-32 with very low mortality. The freeze of March which occurred as far south as Georgia gave the scale a decided setback. In Illinois mortality ran as high as 25 per cent, which, however, was apparently offset by favorable conditions and general reduction in spraying activities. In the spring the insect was quite generally reported as increasingly abundant from New York to Georgia and westward to Illinois, Michigan, and Missouri, and southward to Mississippi and Tennessee. Increasing populations were also reported from Colorado and Oregon, and very heavy infestations were reported from western New York, Michigan, southern Illinois, southern Missouri, southern Mississippi, eastern Texas, and Oregon.

FRUIT APHIDS

Early spring observations indicated that eggs of fruit aphids were quite generally scarce throughout New England, increasing in abundance southward and westward. As the season advanced these insects were quite generally sub-normally abundant throughout the country.

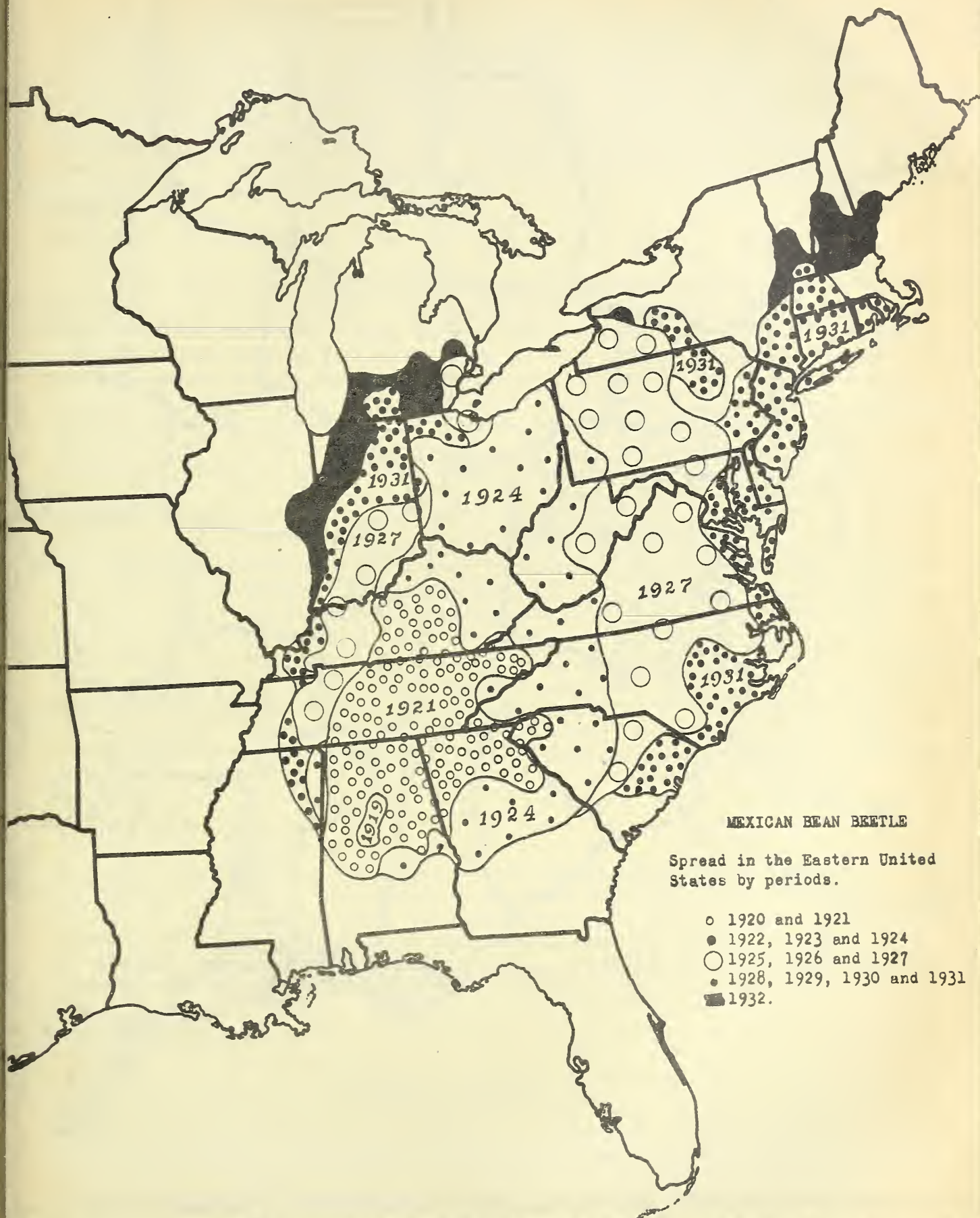
MEXICAN BEAN BEETLE

Adults of the Mexican bean beetle (Epilachna corrupta Muls.) passed the winter exceptionally well in the northernmost part of the territory now known to be infested, and adults were emerging from hibernating quarters during the third week in April in Delaware. By the middle of May they were appearing in numbers in bean fields in the Middle Atlantic States. They increased rapidly in numbers during June and were doing considerable damage over the greater part of their range by the end of that month. During the year the insect was observed for the first time in eastern Illinois, central New Hampshire, southwestern Maine, and two counties farther north in Vermont.

VEGETABLE WEEVIL 1

The vegetable weevil (Listroderes obliquus Gyll.) has been found in new localities in the Northwest and Northeast. During the year it was recorded as infesting the entire northwestern quarter of Louisiana, so this State is now entirely infested. It was found for the first time this year in the State of Arkansas, in the two southeasternmost counties. This weevil has also been found for the first time in Georgia this year, reports of its occurrence having been received from three counties along the western border of the State and from one county in northcentral Georgia. In Texas it was recorded from one additional county immediately west of the territory known to be infested.

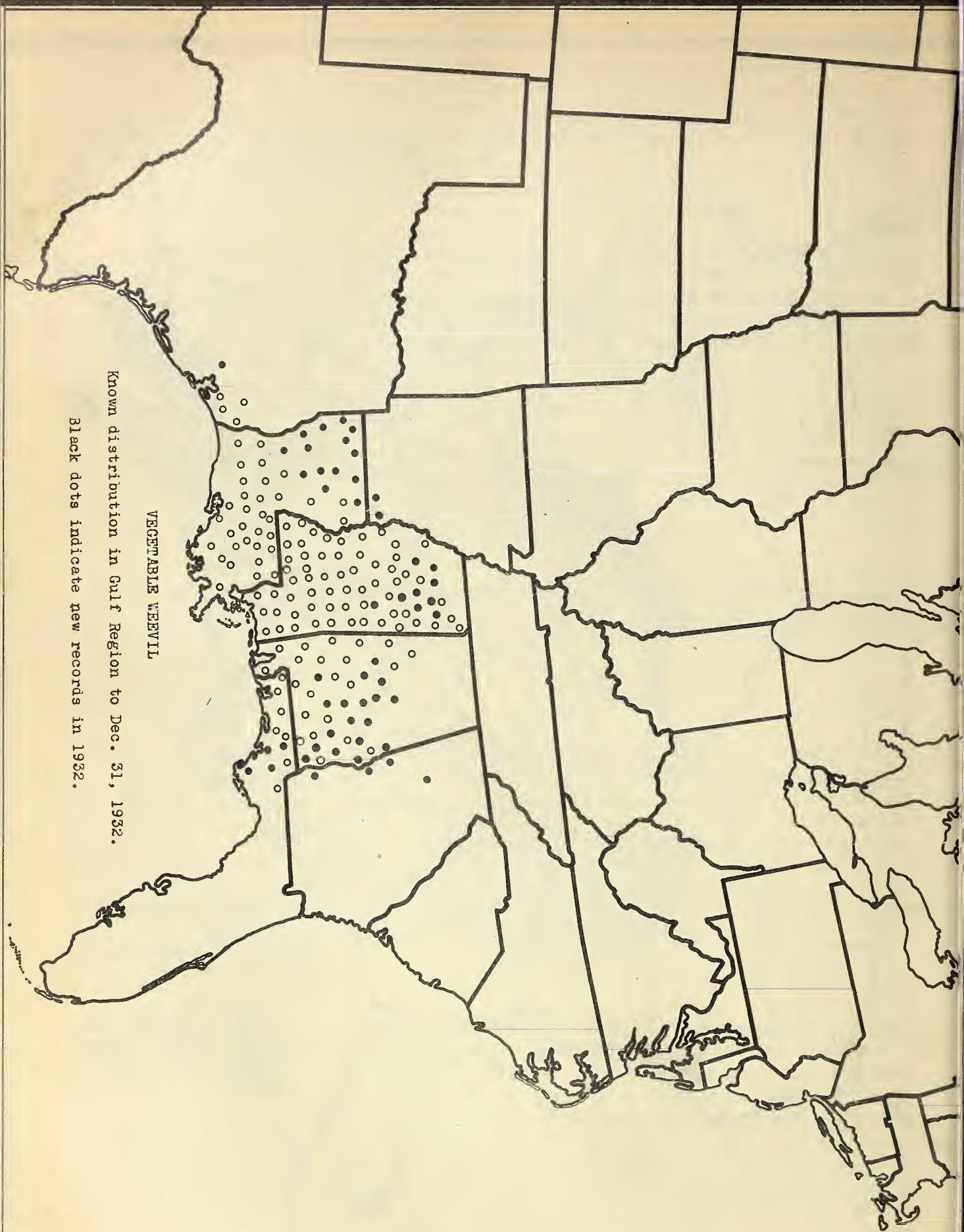
1 M. M. High, Bureau of Entomology, U.S.D.A.



VEGETABLE WEEVIL

Known distribution in Gulf Region to Dec. 31, 1932.

Black dots indicate new records in 1932.



The new counties recorded this year are as follows: Texas: Harrison. Louisiana: Caddo, Red River, De Soto, Bossier, Webster, Claiborne, Bienville, Jackson, Lincoln, Union, Moorehouse, Ouachita, Caldwell, Winn, Grant, Natchitoches, Sabine, and Vernon. Arkansas: Ashley, Chicot. Mississippi: Winston, Webster, Chickasaw, Calhoun, Pontotoc, Panola, Tallahatchie, Lafayette, and Lee. Alabama: Chambers, Macon, Russell, Barbour, Dale, Pike, Houston, Butler, Monroe, Hale, Perry, Autauga, Lowndes, Montgomery, Elmore, Chilton, Bibb, and Shelby. Georgia: Early, Troup, Fulton, and Musco. Florida: Washington, Bay, and Calhoun.

BANDED CUCUMBER BEETLE

During February reports of damage by the banded cucumber beetle (Diabrotica balteata Lec.) to potatoes, turnips, beans, cabbage, and English peas were received from the entire Gulf coast, from Louisiana to Florida. In Florida the damage was said to be quite severe at some points. The insect was reported as having been active throughout the winter. Later in the season it did damage to sweetpotatoes, corn, and other truck crops. This beetle is apparently extending its range of destructive abundance along the Atlantic seaboard. This year fall plantings of snap beans, squash, and cucumbers, in the Charleston district of South Carolina, were severely damaged.

"SWEETPOTATO WEEVIL"

The sweetpotato weevil has been found in the southeasternmost corner in the State of Georgia, many miles north of the generally infested area in Florida. It is now known to be distributed over the southeastern quarter of Texas, through the southern third of Louisiana, and in the Gulf counties of Mississippi, to the southwesternmost county of Alabama. East of this the insect is only established in the peninsula of Florida and in the aforesaid corner of the State of Georgia. There are previous records of the occurrence of this insect in northeastern Texas, southern Oklahoma, northern Louisiana, and isolated localities in Tennessee. These infestations have, however, apparently disappeared.

PEPPER WEEVIL 1

The infestation by the pepper weevil (Anthonomus eugenii Cano) was light and very little damage was caused in southern California during the year. In New Mexico, on the other hand, the infestation was the heaviest since 1926 and possibly even greater than that year; 30 per cent of the crop was destroyed in the Mesilla Valley with heavy damage around Albuquerque. The insect was also numerous north of Las Cruces.

HARLEQUIN BUG

The harlequin bug (Murgantia histrionica Hahn) was more or less active all winter as far north as the Norfolk district of Virginia and as the season advanced it became destructively abundant in Maryland and West Virginia. By the end of the season it appeared in destructive numbers as far north as central Ohio, central Indiana, central Illinois, and southern Iowa--all points considerably north of its normal habitat.

FALSE CHINCH BUG

The mild, dry weather along the Atlantic seaboard, from North Carolina to Georgia and around the Gulf to Mississippi, resulted in what appeared to be an unprecedented outbreak of the false chinch bug (Nysius ericae Schill.). The insect very severely injured many winter truck crops, particularly mustard, turnip, carrot, cabbage, and lettuce.

PICKLE WORM

The pickle worm (Diaphania nitidalis Stoll) continued during 1932 to be seriously abundant somewhat north of its normal range, the mild winter apparently having favored the continuance of this insect in the north. Severe damage was reported from the eastern part of the Gulf region and up the Atlantic seaboard to North Carolina. No unusual conditions, however, were reported from Florida and the western Gulf section of Louisiana and Texas. Damage was also reported as unusually prevalent in Arkansas.

CABBAGE INSECTS

Several of the major lepidopterous pests of crucifers, including the imported cabbage worm (Ascia rapae L.), the cabbage looper (Autographa brassicae Riley), the cabbage webworm (Hellula undalis Fab.), the cabbage aphid (Brevicoryne brassicae L.), and the diamond-back moth (Plutella maculipennis Curt.), continued to work throughout the winter in the winter truck-crop sections from Virginia southward to Georgia, and around the Gulf to Texas, resulting in very serious damage in many sections.

TOMATO PIN WORM

The tomato pin worm (Gnorimoschema lycopersicella Busck) was reported for the first time last year east of the Rocky Mountains, occurring in numbers that year in southern Pennsylvania. This year the insect was positively identified from Florida where it caused considerable trouble to tomato growing about Bradentown. In California this year it was very abundant over most of 4,000 acres of tomatoes in Orange County. In many fields there was a loss of 50 per cent of the crop, while in one field the loss ran to 80 per cent.

PEA APHID

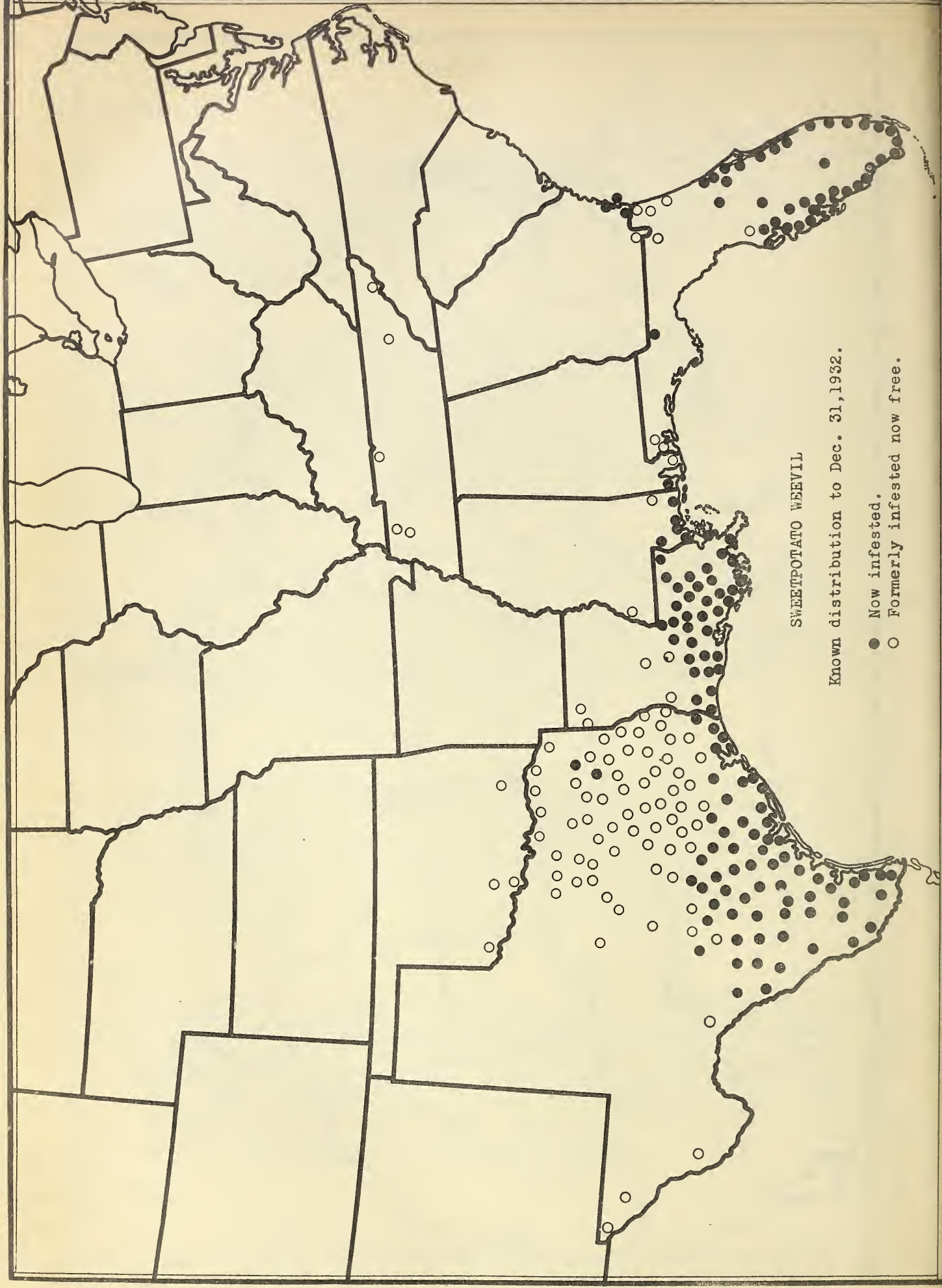
During March the pea aphid (Illinoia pisi Kalt.) was reported as very numerous on Austrian, English, and garden peas from Alabama to Arizona. During May it occurred in outbreak numbers in the North Central States from Pennsylvania westward to Ohio, and southward to the Gulf, most of the infestations having been recorded from alfalfa. By June this insect was making decided inroads on the cannery pea crop in Ohio, Michigan, and Wisconsin, and the late pea crop in the latter State was totally destroyed.

BOLL WEEVIL

The very mild winter of 1931-32 permitted the boll weevil (Anthonomus grandis Boh.) to remain active throughout the usual hibernating period in many sections of the South, with the result that successful wintering of a very large population, in fact the greatest recorded in the past 17 years, resulted. The long-time average survival of this insect in hibernation cages is



BANDED CUCUMBER BEETLE
Known distribution to Dec. 31, 1932.



SWEETPOTATO WEEVIL

Known distribution to Dec. 31, 1932.

- Now infested.
- Formerly infested now free.

approximately 1 per cent whereas last year the survival ran from 4 to above 18 per cent. The spring and early summer continued favorable for the weevil and the early-crop cotton was very seriously damaged during July. The reduction of some 25 per cent reported in the August 1 crop report was ascribed very largely to this heavy weevil population and the reduced use of insecticides due to the financial situation. Hot, dry weather during August very materially relieved the situation by killing a large proportion of the weevils in the squares. In western Texas and western Oklahoma weevil populations were extremely low and weather conditions favorable for cotton.

PINK BOLL WORM

Inspection of gin trash during the late summer and fall, using the gin-trash machine, indicated that the infestation of the pink boll worm (Pectinophora gossypiella Saund.) in the Big Bend district of Texas was the heaviest in the history of the infestation in that area. This was further complicated by two severe floods which washed away a large amount of possibly infested material. Inspection of flood debris has indicated that large numbers of worms are in this material. During June the insect was discovered in wild cotton in southern Florida. A survey disclosed that this infestation extended from Lake Worth in Palm Beach County southward to the Florida Keys and well out on these keys, thence half way up the west coast to Manatee County. This territory, however, is not within the commercial cotton-growing areas and was widely separated from the eastern Cotton Belt. Late in the fall a light infestation was found at three points in northern Florida in Alachua and Columbia Counties, the first time that this insect has been recorded in the eastern Cotton Belt.

SUGARCANE BORER

The sugarcane borer (Diatraea saccharalis Fab.) remained active throughout the winter of 1931-32. The cold weather of March materially checked the insect, however, by killing a large part of the sugarcane tops in Louisiana, and in consequence much less damage than usual was done this year. Large numbers of two South American parasites of this insect, Paratheresia claripalpis V. d. W. and Ipobracon rimac Wolcott, were liberated in the Gulf region during the year. A late fall survey of the area in Louisiana devoted to sugarcane showed that sugarcane borer damage ranged on the whole from 5 to 100 per cent of the stalks infested. Toward the northern limits of the infested area the infestation went as low as 2 per cent. The joint infestation was not excessive, even in fields where all the stalks were infested.

BROWN SUGARCANE ROOT WEEVIL

The brown sugarcane root weevil (Anacentrinus subnudus Buchanan) was described this year. 1 An insect now identified as this species was first observed in 1910 at Berwick, La. It was collected in 1912 on sugarcane stubble at New Orleans, and again in 1919. In 1925 it was found damaging sugarcane by boring into the woody part of the plant. Similar damage was observed in 1929 and 1930 in Louisiana. In 1931 a first-year's stubble field near Arnaudville, La., was almost totally ruined by this insect. In the spring of this year a large number of buds were killed by this weevil, but in general it was not so abundant as it was last year.

PERIODICAL CICADA

Brood VI of the periodical cicada (Magicalicada septendecim L.) is an unimportant scattering one, although it covers a wider territory than any of the other 17-year broods. For the most part the brood is recognized by the appearance of a few individuals. As in previous years, rather strong broods appeared in the extreme northwestern part of its range in Wisconsin, and in the extreme southeastern part of its range in the Carolinas. Strange to say the strong broods reported in northern Michigan in 1898 are not recorded as having appeared in 1915 or this year. In fact, the insect was not even observed in that State. The following list gives the States and counties in which Brood VI appeared this year:

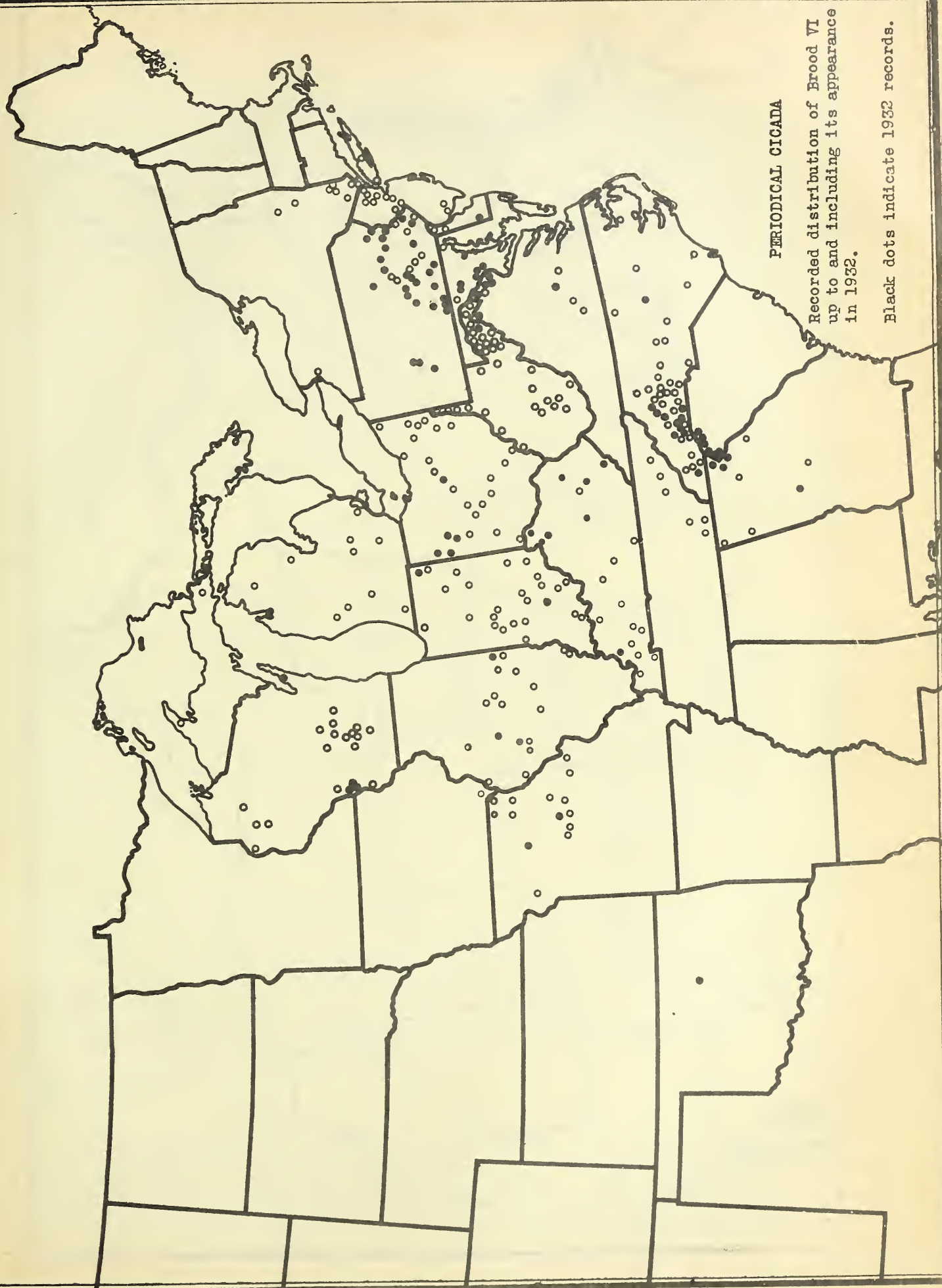
Delaware, Sussex.
Georgia, Hambersham, Pike, Rabun, Stephens.
Illinois, Mason, Morgan, Vermilion.
Indiana, Lawrence, Steuben;
Kentucky, Breathitt, Crittenden, Elliot, Gallatin, Grant, Letcher, Livingston, Kenton, Madison.
Maryland, Frederick, Montgomery, Prince Georges.
Missouri, Boone, Linn.
North Carolina, Buncombe, Burke, Caldwell, Catawba, Henderson, Macon, McDowell, Polk, Wake.
Ohio, Allen, Auglaize, Paulding, Richland, Van Wert.
Oklahoma, Payne.
Pennsylvania, Adams, Carbon, Dauphin, Franklin, Juniata, Luzerne, Lycoming, Monroe, Montgomery, Northampton, Westmoreland, York.
South Carolina, Greenville, Oconee, Pickens.
Virginia, Arlington, Fairfax, Loudoun, Powhatan.
West Virginia, Hampshire.
Wisconsin, Door, Vernon.

WALKINGSTICKS

During September a very heavy infestation of forest trees by walkingsticks caused severe defoliation in limited areas in southern Pennsylvania. During October a similar outbreak was reported from Ohio.

JAPANESE BEETLE

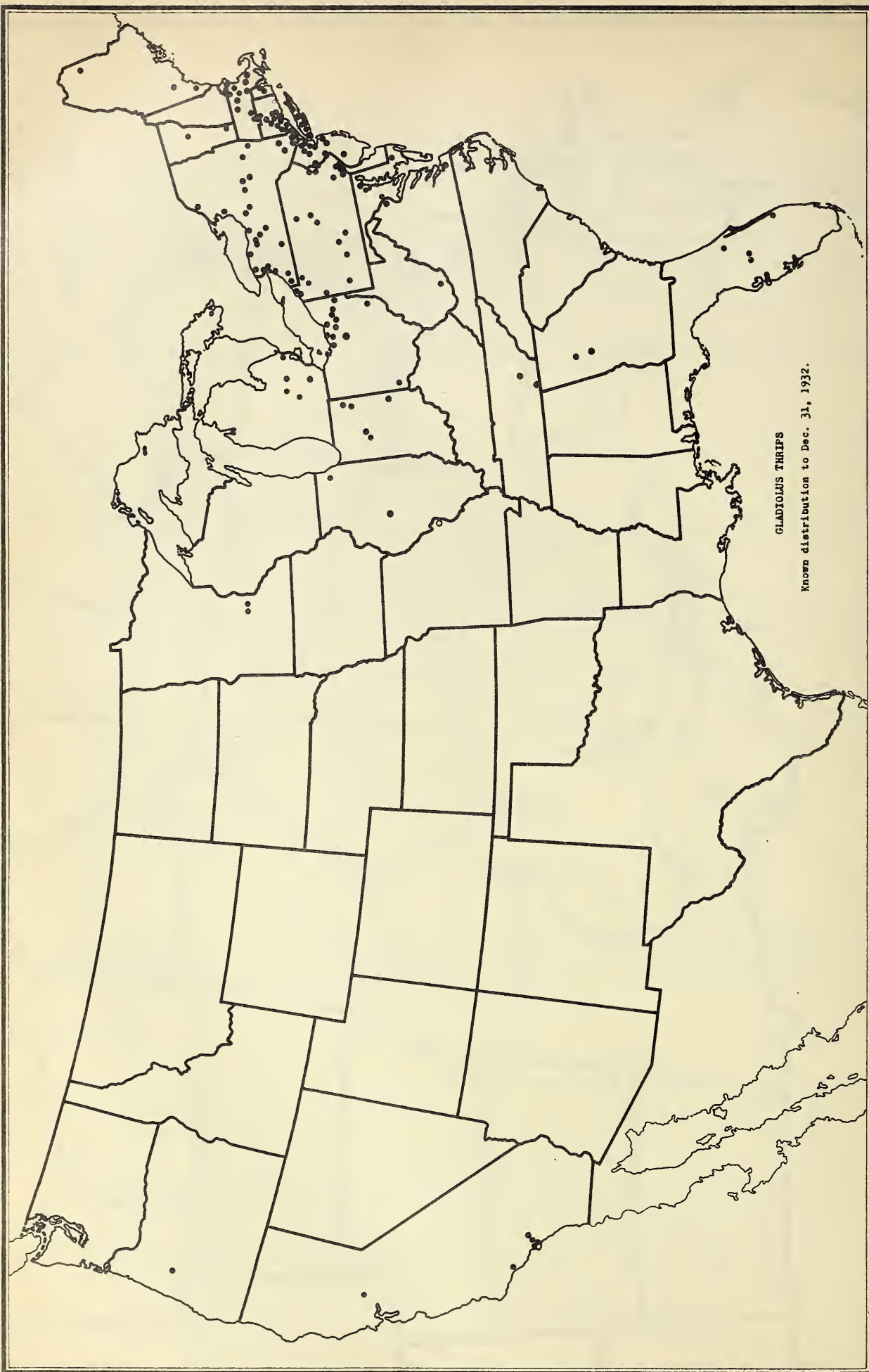
The area of continuous infestation by the Japanese beetle (Popillia japonica Newm.) is estimated to cover approximately 7,000 square miles and includes practically all of New Jersey except the northern counties, the five counties west of the Delaware River in Pennsylvania, and northern Delaware south to Port Penn, with areas of infestation in New York, Connecticut, Rhode Island, Massachusetts, Maryland, Virginia, and the District of Columbia. Traps placed this summer outside of the area already quarantined resulted in the discovery of infestations at several points outside of the previously regulated area. Among these were Augusta and Portland, Me.; Concord, Dover, Keene, Manchester, Portsmouth, and West Lebanon, N.H.; Bellows Falls, Brattleboro, and White River Junction, Vt.; Canton, Cleveland, Steubenville, and Zanesville, Ohio; Detroit, Mich.; Charles Town, Martinsburg, and Wheeling, W. Va.; Durham, Raleigh, and Winston-Salem, N.C.; and Florence, S.C. This insect appears to be decreasing in numbers and damage in the areas longest infested.



PERIODICAL CICADA

Recorded distribution of Brood VI
up to and including its appearance
in 1932.

Black dots indicate 1932 records.



GLADIOLUS THRIPS
Known distribution to Dec. 31, 1932.

ELM LEAF BEETLE

The elm leaf beetle (Galerucella xanthomelaena Schr.), which increased to troublesome numbers in 1931, continued as a serious pest during 1932. In Massachusetts thousands of elm trees were seriously damaged. In Connecticut, although it did considerable damage in many towns and necessitated spraying, it was not so numerous as it was in 1931. Similar reports of serious damage were received from the southern third of Maine. In New Hampshire, although present in noticeable numbers, it was not so serious as last year. It was also present in troublesome numbers in Vermont. The conditions that prevailed in New England extended over the lower Hudson River Valley in New York. The insect was also reported in outbreak numbers throughout southeastern Maryland, south and east of Baltimore City and into Delaware. It appeared in destructive numbers in a number of cities and towns throughout western and southwestern Ohio and reports of lesser defoliation were received from scattered localities in Kansas, Kentucky, and Tennessee. On the Pacific Coast this pest was quite injurious to elms in the Yosemite Valley of California, in the Willamette Valley in Oregon, in the Yakima Valley of Washington, and around Parma in Canyon County, Idaho. The Federal parasite laboratory at Melrose Highlands, Mass., received a large shipment of the egg parasite Tetrastichus xanthomelaenae Rond. from Budapest, Hungary, this year.

GYPSY MOTH AND BROWN-TAIL MOTH

The first gypsy moth (Forthetria dispar L.) egg clusters observed hatching this year were seen on May 2. Hatching became general about May 9 and the maximum hatch occurred about the middle of the month. Up to the end of May 67 infested sites, with an aggregate of 885 egg clusters, were found in the barrier zone, the western-most point of which was 15 miles east of the New York State line in Connecticut. During the year over 40,000 acres were entirely defoliated and nearly 11,000 acres practically defoliated. No moths have been found this year in the area formerly infested in New Jersey where an eradication campaign was started ten years ago, nor has the insect been seen in this area since 1929. The moth was discovered late in July in northeastern Pennsylvania in an outlying mountain district near Pittston, Luzerne County. The infestation is now known to exist in eight townships; Pittston, Jenkins, Plains, Bear Creek, Wilkes-Barre, Kingston, and Exeter, in Luzerne County; and Lackawanna in Lackawanna County.

During 1930 a fungous disease, Entomophthora ulicae Reck., of the brown-tail moth (Nygmia phaeorrhoea Don.) became epidemic in heavily infested orchards in parts of New Hampshire and Maine. In 1931 the disease was not so prevalent as in 1930 and this year we received reports of a general increase of the insect in Maine.

SATIN MOTH

During the past year the towns of Woodstock and Lincoln, N. H., north of the quarantine line, have been found infested by the satin moth (Stilpnotia salicis L.). Within the infested territory severe defoliation was recorded as far north as Waterville, Bath, Brunswick, and Bangor, Maine, and Wakefield and Wolfeboro, N. H. There was some severe defoliation in

seven towns in Massachusetts. Throughout the remainder of the infested territory the defoliation was much less severe than in previous years.

EASTERN TENT CATERPILLAR

Early in the spring generally heavy infestations by the eastern tent caterpillar (*Malacosoma americana* Fab.) were reported in Maine as far north as Augusta, in southern New Hampshire and Vermont, in eastern Massachusetts, through Connecticut to southern New York in the Hudson River Valley and on Long Island, in southeastern Pennsylvania, in Delaware, and from the coastal plain section of Maryland and Virginia to central Georgia. For the most part these did not prove very serious as the season advanced, although there was considerable defoliation in limited localities. In eastern Texas (Brazos County), where it was defoliating red haw, this insect was reported during March as more abundant than it had been observed in many years. This insect, associated with the forest tent caterpillar. (*M. disstria* Hbn.), appeared in severe outbreak numbers near Sioux City, Iowa, and the latter insect occurred in one of the heaviest outbreaks yet recorded in Maine, several square miles of forest area having been seriously defoliated in the southwestern counties.

BAGWORM

The bagworm (*Thyridopteryx ephemeraeformis* Haw.) was very abundant and destructive during the past summer in the Ohio and Mississippi Valley regions, reports of serious defoliation having come from central and southwestern Ohio, the southern half of Indiana and Illinois, central and eastern Kentucky, and southward to northwestern Alabama, and most of the State of Mississippi to the eastern third of Texas, the southernmost point being in Galveston County. The insect was also reported from Maryland, Delaware, New Jersey, and southeastern Pennsylvania northward to the vicinity of New York City. In the West Central States the insect was reported from southeastern Nebraska and southern Minnesota; this section is north of the usual range and the occurrence of this insect there from time to time is probably correlated with mild winters.

TERMITES 1

During the calendar year 1932, 1,568 cases of termite (*Reticulitermes* spp.) injury to buildings were reported to the Federal Bureau. These were regionally and chronologically distributed as follows:

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	
New Eng.	2	2	2	5	2	5	5	4		3			30
Mid. Atl.	13	27	65	90	79	65	39	40	27	24	25	22	516
So. Atl.	10	26	38	55	53	34	23	29	14	21	9	19	331
E. Cent.	10	6	18	33	22	16	9	12	7	5	8	6	152
N. Cent.		1			9	1	2	1	3		2	3	22
W. Cent.	4	3	4	20	15	21	11	9	16	14	12	12	141
L. Miss.	29	14	15	46	43	29	38	29	11	10	1	6	271
S. W.		1	12			1	2		11	12	4	3	46
Pacif.	6	7	5	7	10	2	5	5	5	4	2	1	59
Total	74	87	159	256	233	174	134	129	94	93	63	72	1,568

1 T. E. Snyder, Bureau of Entomology U. S. D. A.

NEW AND LITTLE KNOWN PESTS

The cherry sawfly leaf miner (Profenusa collaris MacG.) was discovered for the first time in Michigan at Grand Rapids, where it was attacking nurello cherries. This insect has heretofore been recorded only from New York and Massachusetts. It was first observed in 1910 damaging cherries at Geneva, Germantown, and Schenectady, N. Y. In 1914 MacGillivray described it as a new species. It has continued to be a minor pest in New York State since that time, attacking, in addition to cherries, ornamental hawthorns. In 1915 Rohwer described a parasite of this insect as Pezoporus tenthredinarum.

The leaf-curling apple midge (Dasyneura mali Kieff.) has apparently established itself at Ipswich, Mass. This is a European insect which apparently has not previously been recorded from this country.

The European moth Cnephasia longana Haw., which was discovered in this country for the first time in 1929 as a pest of strawberry and iris in Oregon, became quite serious this year in the State of Washington, where it was attacking, in addition to strawberries, a number of plants, particularly the blossoms of bulbous iris.

During the year the tenebrionid beetle Crypticus obsoletus Say¹ was found injuring strawberries at Long Beach, Miss. The insects were attacking the immature fruit and also feeding on ripe fruit. This appears to be the first record of this insect attacking any economic crops, although it is an old species and a native of the southeastern part of the United States.

The Pacific red spider (Tetranychus pacificus MacG.), heretofore known only from San Joaquin and Stanislaus Counties in California, where it is a serious pest of European grapes, extended its range to vineyards in Fresno, Tulare, and Kern Counties.

A common European weevil, Hypera rumicis L., known to attack rhubarb and several species of dock (Rumex spp.), is well distributed in this country, specimens in the National Museum having been collected from Connecticut, New York, New Jersey, Iowa, North Dakota, Kansas, and Oregon, as well as from Alberta, Canada. In the United States, however, it had not been reported as a pest until this year when it was found seriously damaging sorrel (Rumex acetosella) by feeding on the leaves and blossoms at Milford, Conn. This sorrel was being grown for seed, the crop being grown as a garden crop by European gardeners in that State.

A weevil, Ceutorhynchus tau Lec., was described from Texas in 1876. The insect was unheard of from that date to this year, when the larvae were found infesting seedling onions near Robstown, Tex., ruining a 50-acre plantation. It was also found at Raymondsville and Schuttenberg in the same State, attacking both onion and garlic.²

1 M. M. High, U. S. D. A., Bureau of Entomology

2 Journal of Economic Entomology 25: 1110, 1932.

A weevil, Pseudocneorrhinus setosus Roelfs, a native of Japan, was first collected in North America, so far as our records show, on August 3, 1914, in a nursery at Riverton, N. J. In 1920 this species was found in a nursery in New Haven, Conn., where it was feeding on burr marigold (Bidens sp.). It was again collected in New Haven in 1921, 1922, and 1923. In 1931 it completely stripped a hedge of California privet and a row of Japanese barberry bushes in that city, and this year did considerable damage to these plants.

The white spruce sawfly (Diprion polytomum Htg.), which caused rather severe defoliation of white spruce in the Gaspé peninsula of Canada for the past three or four years, was discovered at Bar Harbor, Maine, this year.

MOSQUITOES

An unprecedented outbreak of the mosquito Psorophora columbiae D. & K. occurred during September in the Everglades section of Dade County, Fla. On September 4, following a northwest wind which blew for several days, enormous numbers of these large mosquitoes were observed. By the 5th they had increased to unprecedented numbers, and by evening of that day the buzzing was as loud as that of a swarm of bees. During the night live-stock could be heard running and thrashing in the underbrush, and on the morning of September 6, dead animals were found throughout the section. The recorded mortality was 80 head of cattle, 3 horses, 1 mule, 67 hogs, 20 chickens, and 2 dogs. Pots-mortem examinations showed no mosquitoes in the respiratory apparatus, indicating that the animals died either from loss of blood, nervous exhaustion, or the effects of some toxin. It was officially reported that the milk supply from this district (Hialeah) was reduced to 1,000 gallons a day during the four days of the mosquito infestation.

ROCKY MOUNTAIN SPOTTED FEVER TICK AND BLACK WIDOW

The very serious tick-borne disease, Rocky Mountain spotted fever, heretofore confined to certain Rocky Mountain valleys in the Northwest, was found to be very prevalent in parts of Maryland and Virginia. By the middle of August 41 cases had been reported from this region. In this same region the black widow spider, (Lathrodictes mactans Fab.), one of the more poisonous forms, the bite of which is often associated with serious results, was extremely numerous during the past summer.

SUMMARY OF INSECT CONDITIONS IN HAWAII FOR 1932

O. H. Swezey

The pink sugarcane mealybug (Trionymus sacchari Ckll.) has become scarcer in the fields, owing to the establishment and wide spread of the introduced parasite Anagyrus saccharicola Timb. from the Philippines. The parasite has been found generally established throughout the cane districts.

The Chinese grasshopper (Oxya chinensis Thumb.) continues to spread, and is found more widely attacking cane on the islands of Maui and Hawaii, although it is usually not severely injurious. The egg-parasite Scelio pambertoni Timb., introduced from the Federated Malay States, has been widely colonized and has been recovered in two districts, which indicates that it has become established and will no doubt eventually check further increase of this grasshopper.

The grubs of the Asiatic beetle (Anomala orientalis Waterh.) continue injurious on one plantation in the infested area. The seriously infested area in this plantation is somewhat larger than in the previous year. That the plantation has not suffered particularly is evidenced by the fact that it produced more tons of sugar this year than in any previous year. Scolia manilae Ashm., the introduced Philippine wasp, is enormously numerous in the cane fields, and its control of the root grub is sufficient to keep the latter from being disastrously destructive in this plantation.

There were extensive outbreaks of armyworms (Cirphis unipuncta Haw. and Spodoptera mauritia Boisd.) in sugar plantations in several localities in the early part of the year. The numerous introduced parasites were not able to control them fully, and artificial methods of control were practiced.

The sugarcane weevil borer (Rhabdocnemis obscura Boisd.) continues significantly injurious in some localities but in general is well controlled by the introduced New Guinea tachinid Ceromasia sphenophori Vill. Where the variety P.O.J. 36 has replaced other varieties there has been a lessening of borer damage, as there has also been where there has been better control of rats in the fields.

The sugarcane leafhopper (Perkinsiella saccharicida Kirk.) has remained under satisfactory control by its introduced natural enemies. No outbreaks of any consequence were known of; in fact, the pest was so scarce everywhere as to be difficult to find.

The rice borer (Chilo simplex Butl.) has not given particular trouble this year, and about normal rice crop was produced.

The souring beetle (Cardophilus humeralis Fab.) has increased enormously, owing to the fact that the output of the pineapple canneries was limited; and on account of this much fruit was left to rot in the fields, furnishing opportunity for this beetle to increase to a much greater extent than usual. In a pineapple field plowed up and planted to sugarcane the beetles were so numerous as to do considerable damage to the planted cane, destroying the "eyes" and also boring into the ends of the "seed" cuttings.

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The pineapple mealybug (Pseudococcus brevipes Ckll.) is found more frequently in cane fields than formerly, though it is not to be considered of particular importance. It continues as an important pest in pineapple fields, where cultural practices and spraying methods have been perfected for its control.

The avocado mealybug (Pseudococcus nipae Mask.) was nowhere observed during the year, either on avocado, fig, or mulberry, which were always so thoroughly infested before the introduction of the parasite Pseudaphycus utilis Timb. from Mexico in 1922.

The Mediterranean fruit fly (Ceratitis capitata Wied.) has been about as prevalent as for the past few years. If anything, the infestation of mangoes and guavas has been a little less, and coffee is particularly free from infestation.

The coconut leafroller (Omiodes blackburni Butl.) has been sufficiently controlled by its parasites in Honolulu and vicinity so that the coconut trees have a fine appearance with perfect leaves. On the windward side of the island, however, the coconut leaves are very ragged, owing to ravages of the caterpillars, probably because their parasites are not working so favorably there. On the islands of Kauai and Maui, too, the coconut leaves are badly infested.

The corn ear worm (Heliothis obsoleta Fab.) has been unusually prevalent. Nearly every ear of sweet corn is found attacked by one or more caterpillars.

A mirid bug, Engytatus geniculatus Reut., is always present on tomato vines. It is reputed to destroy some of the flower buds, thus lessening the crop.

The tomato pin worm (Gnorimoschema lycopersicella Busck) is usually present on tomato leaves, but not to cause particular injury.

The potato tuber moth (Gnorimoschema operculella Zell.) is becoming of more importance as a pest on the potato tubers. It has been present for a long time, but operated chiefly as a leaf miner on potato, tomato, tobacco, Datura, etc.

The taro leafhopper (Megamelus proserpina Kirk.) was not to be found this year in the Waianae district, where taro was found badly infested the previous year. At that time (the first appearance of this insect in Hawaii) efforts were made to eradicate it and apparently success was attained.

The melon fly (Bactrocera cucurbitae Coq.), although prevalent, must have been fairly well controlled by its parasite Opius fletcheri Silv., for an unusually good crop of melons was produced and the season was quite prolonged.

The rose beetle (Adoretus sinicus Burm.) has been prevalent as usual as a garden pest. Although *Scolia* wasps parasitize its grubs, yet no apparent control is attained. Efforts are being made to introduce additional parasites. Many hundreds of cocoons of Tiphia lucida Ashm. have been received from the Philippines. The wasps are slow about developing,

and issue irregularly. Not enough have yet issued and been released to assure its becoming established.

The gladiolus thrips (Taeniothrips gladioli M. & S.) first came to the attention of the entomologists in Hawaii in November. In the florists' gardens in several parts of Honolulu the infestation was so severe as to ruin the entire crop of gladiolus. Examination in other districts showed this thrips to be widespread already, although not all gardens were infested. Immediate investigations on Maui and Hawaii revealed the pest to be present there also.

The first positive evidence that the oxwarble fly Hypoderma lineatum DeVill. is established in Hawaii was obtained in November, when the entomologists' attention was called to perforated hides freshly removed from cattle at the slaughter-house in Honolulu. The cattle were from a large ranch on the island of Hawaii, and were said to be island-born. Many times warbles have been found in the backs of imported dairy cows and breeding stock, and they were treated for removal of warbles. The men at the slaughter-house said that they had previously found perforations in hides, and also the warbles, but at this time they were more numerous than they had ever seen them. Sometimes there were as many as 10 or more in a single hide.

The horn fly (Haematobia irritans L.) continues to be a very troublesome pest on the cattle of the ranches as well as on dairy cows. It breeds continuously the year round and is abundant at all times.

